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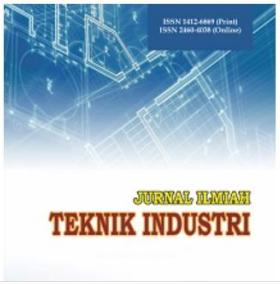

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Factors Affecting Customer Satisfaction in e-Commerce

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Abstract. *This research aims to identify the influence of website quality, product quality, product price, and safety shopping on e-commerce customer satisfaction and determine the significant factor influencing e-commerce customer satisfaction. The method used in this research is multiple linear regression analysis to identify the relationship between independent variables and dependent variables. This research uses the purposive sampling technique to determine the sample size through an online questionnaire to obtain the primary data. The 184 respondents respond to the online questionnaire through social media. This research shows that website quality, product quality, product price, and safety shopping simultaneously influence customer satisfaction. Furthermore, the most significant factor affecting customer satisfaction is product quality; this factor contributes as much as 38% among the other three independent variables in this research.*

Keywords: *customer satisfaction, quality, e-commerce, linear regression*

I. INTRODUCTION

The development of digital technology is increasing rapidly and has a significant effect on all aspects of human life (Makridakis, 2017). The development of this technology has led people to a digital lifestyle. A digital lifestyle is a form of urban human behavior that depends on the internet, mobile applications, or electronic devices to meet all their needs (Abdel-Aziz et al., 2016). The existence of a digital lifestyle gives people an option to buying and selling transactions through e-commerce. E-commerce is one of the results of combining digital technology and the internet with conventional industries and aims to significantly improve productivity, efficiency, and consumer services (Niranjanamurthy & Chahar, 2013). Through e-commerce, several conveniences are obtained, such as saving time, saving energy that is expended, obtaining more variety of products, and getting lower prices.

Customer satisfaction is an indicator used to measure the customer's interest in online shopping. Customer satisfaction is the customer's feeling happy after using or consuming a product from a company (Abadi et al., 2020). Several factors influence customer satisfaction. The first factor is website quality. According to (Ali, 2016) research, website quality has a significant relationship to customer satisfaction. In line with that research, Sun & Lin (2009) also stated that customer perceptions of website quality are based on features that meet customer needs and illustrate the website's absolute advantage. Then the second factor that affects customer satisfaction of e-commerce is safe shopping. Research conducted by Noviarni (2018); Ishak (2012) conclude that security or safe shopping, especially those related to payment processing and customer personal data, affects customer satisfaction when they shop in e-commerce. The next factor is the price of a product. Research by Mediti (2020); Susanti (2016) indicate that price of a product affects customer satisfaction. And then, the quality of the online shop's product also affects customer satisfaction. According to research conducted by Lestari (2018); and Susanti (2016), product quality has an important role or has a significant relationship with customer satisfaction. Product quality affects the product's performance or service, closely related to customer value and satisfaction (Choi & Kim, 2013).

Based on the explanation above, it is known

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that customer satisfaction of e-commerce influence by various factors, website quality, product quality, product price, and security. But in the past research, the factors that influence e-commerce customer satisfaction was studied separately. Several studies have measured customer satisfaction only from the website's appearance, how easy to access it, and how the information is provided. Meanwhile, other studies focus on product price, quality, and safety shopping to measure customer satisfaction. This research will combine the four factors from previous research and determine how each factor influences customer satisfaction. The type of e-commerce that used in this research is Customer to Customer (C2C). Customer to customer (C2C) is a type of online transaction between customer and customer. In this type of e-commerce, individual customers can sell or buy products from another customer. This research was conducted to determine the significant factors that influence e-commerce customer satisfaction. Thus, the result of this research can use as a suggestion for e-commerce sellers to develop or improve their services to fulfill their customer's satisfaction. And also, this suggestion will increase the number of sales turnovers and make e-commerce a sustainable business.

II. RESEARCH METHOD

This research will combine the four factors: website quality, product quality, product price, and safety shopping, and then determine how far the influence of each factor is on customer satisfaction of e-commerce.

Preliminary Study

The first step to conducting research is a preliminary study. It aims to find out data and information related to the significant factor influencing customer satisfaction of e-commerce. The data and information needed are the current condition of internet users in Indonesia, the interest in e-commerce in Indonesia, and what factors affect customer satisfaction during online shopping in e-commerce. The data and information were obtained from several trusted websites and journals.

Data Collecting

Data collection in this research using a questionnaire data collection technique. The questionnaire distributes according to problems studied and aimed to obtain data in the respondent's statements. A closed questionnaire with multiple choice will use in this research. The measurement scale used is the semantic differential scale. Data collection in this research was carried out directly by distributing questionnaires to respondents who met the criteria. The questionnaire was distributed using Google Forms via social media with a minimum sample size of 125 people. After distributing the questionnaires, 184 respondents met the criteria. In the questionnaire, respondents can assess three e-commerce if they meet the specified requirements: shopping more than once and less than six months ago. Three e-commerce sites can be assessed, namely Shopee, Tokopedia, and Bukalapak. From the 184 respondents, there were 199 assessments obtained.

Research Variables

Variables in this research are dependent variables and independent variables. The dependent variable is customer satisfaction (Y). The independent variables in this study are Website Quality (X_1), Product Quality (X_2), Product Price (X_3), and Safety Shopping (X_4). The relationship between variables can be seen in Figure 1.

Figure 1. Conceptual Model

From the conceptual model, research hypotheses can develop as follows:

H1 = website quality significantly affects customer satisfaction of e-commerce

H2 = product quality significantly affects customer satisfaction of e-commerce

H3 = product price significantly affects customer satisfaction of e-commerce

H4 = safety shopping significantly affects customer satisfaction of e-commerce

Data Processing

This research's appropriate method is Multiple Linear Regression. Its use determines the direction between dependent and independent variables; is it positive or negative, and predicts the dependent variable's fluctuation if two or more independent variables as predictor factors manipulate. This method also determines which independent variable significantly affects the independent variable. The steps taken in this research are:

a. Questionnaire design and validation
b. A preliminary survey to perform validation and reliability tests
c. Data collection through questionnaires
d. The classical assumption test aims to ensure the research results are valid, unbiased, and consistent.
e. Design multiple linear regression models
f. Determine hypothesis test
g. Determine Relative Contribution (SR) and Effective Contribution (SE)
h. Design Nonparametric Test; Kruskal-Wallis Test and Mann-Whitney Test

III. Result and Discussion

After the data is collected, the data is processed from the research instrument test, classical assumption test, multiple linear regression analysis, and hypothesis test..

Research Instrument Test

Before the questionnaire is used to answer the research objectives, a preliminary survey is conducted to test the validity and reliability of the questionnaire. According to Mahmud (2011), the preliminary survey should be conducted on at least 30 respondents. Validity defines as the extent to which any measuring instrument measures what it is intended to measure. Validity test not measuring the instrument itself but also measuring the instrument concerning the purpose for which it is used (Barbera & VandenPlas, 2011). The validity test of each variable was carried out using the SPSS software version 24.0. This validity test uses a significant level of 5%, and the amount of data (n) is 30, so with the provisions df (n-2) or (30 - 2) = 28, then the r_{table} is 0.361. If the r_{count} is greater than the r_{table}, the question item can be said valid (Syakur et al., 2019). Reliability test concerns the extent to which an experiment, test, or any measuring procedure yields the same results on repeated measurements. Repeated measurements never precisely duplicate each other, but it consistent from measurement to measurement. The consistency found in repeated measurements is referred to as reliability. The criteria used in this reliability test are Cronbach Alpha. If Cronbach Alpha is bigger than the critical point (0.7), the question items in the questionnaire are reliable (Taber, 2018). In addition, George and Mallery (2003) provide the following rules to describe the internal consistency: if Cronbach Alpha > 0.9 – excellent, > 0.8 – good, > 0.7 – acceptable, > 0.6 – questionable, > 0.5 – poor, and < 0.5 – unacceptable. Based on the results test, all question items on the dependent variable and independent variables are valid and reliable.

Classical Assumption Test

Furthermore, the questionnaire was distributed to 125 respondents. The Classical Assumption Test carried out the data from the questionnaire. According to Atmadja, 2018 the classical assumption test aims to ensure the research results are valid, unbiased, and consistent. There is seven classical assumptions of ordinary least squares (OLS) linear regression, and the first six assumptions are mandatory.

Linear Regression Model

The linearity test is used to determine whether two or more variables have a significant linear relationship. The Sig can do the linearity test. Deviation from linearity in Table ANOVA. If the value of Sig. Linearity < 0.05, then the linear regression can explain the influence of variables

that exist and if the value of Sig. Deviation from linearity > 0.05, then the linear regression can be used to explain the influence of existing variables (Widhiarso, 2010). Based on the linearity test result, it is found that the value of sig. Linearity of all variables is less than 0.05 (0.00 < 0.05), and the value of sig. Deviation from linearity greater than 0.05. So, it can be concluded that there is a linear relationship between variables, or linear regression can explain the influence of variables.

Zero Mean Value of Disturbance

The Y predicted value and the Y observation value depend on the independent variables and other factors. These factors are called disturbance value, which u symbolizes. Given the value of X, the mean, or expected, the disturbance term ui value should be zero, E(ui | Xi¬) = 0. It means that no matter which value choose for X, the error term u must not show any systematic pattern and must have a mean of 0 (Gujarati, 1995). Based on the calculation in this research, it is obtained that the mean value of disturbance is 0. So, the second assumption of ordinary least squares (OLS), the zero mean value of disturbance, is fulfilled.

All Independent Variables are Uncorrelated with The Error Term

This assumption states that the disturbance u and explanatory variable X are uncorrelated. This assumption is that we assumed that X and u (which may represent the influence of all the omitted variables) have a different influence on Y. Therefore, if X and u are positively correlated, X increases when u increases, and it decreases when u decreases. In that case, it isn't easy to separate the influence of X and u on Y (Gujarati, 1995). The calculation is carried out by multiplying the value of each variable with the disturbance value. Based on the calculation in this research, the sample covariance between the regressors and the OLS residual is zero, so all independent variables are uncorrelated with the error term, and the third assumption of ordinary least squares (OLS) is fulfilled.

No Autocorrelation Between The Disturbances

The term autocorrelation can be defined as "correlation between members of series of observations ordered in time (in time series data) or space (as in cross-sectional data). In the regression context, the classical linear regression model assumes that such autocorrelation does not exist in the disturbances. In this research, the autocorrelation test used the value of Durbin Watson table and use n = 199 and total independent variable k = 4, the d_U value from the Durbin Watson table is 1.809, the 4 – d_U value is 2.190, the dL value is 1.727, and the 4-d_L value is 2.272. Based on the result, the Durbin-Watson (DW) value obtained is 2.005. This value lies between the d_U and 4-d_U (1.809 < 2.005 < 2.190), therefore there is no autocorrelation in this regression model.

The Error Term Has a Constant Variances (Homoscedasticity)

A critical assumption of the linear regression model is that the disturbances have all the same variances. If this assumption is not satisfied, there is heteroscedasticity. The consequences of heteroscedasticity are the t-test and F-test can be highly misleading and resulting in erroneous conclusions (Gujarati, 1995). The heteroscedasticity test in this research was carried out using the scatterplot graph method and the Rank Spearmen method. The heteroscedasticity detects from the specific pattern in the scatterplot graph method and the Asymp. Sig value of the Rank Spearmen test. The significance value of the website quality (X_1) variable is 0.725, the product quality (X_2) variable is 0.521, the product price (X_3) is 0.455, and the safety shopping (X_4) variable is 0.913. Because the significance value of all variables is above 0.05, it can be concluded that this regression model is free from heteroscedasticity.

There Is No Perfect Multicollinearity

The term multicollinearity is due to Ragnar Frisch (1934), indicating a "perfect" or precise linear relationship between some or all of the explanatory variables in a regression model. The consequences of multicollinearity are as follows: if there is perfect collinearity among the X's, the regression coefficients are uncertain, and the standard errors are undefined (Midi et al., 2010). Multicollinearity can be seen from the tolerance value and the VIF (Variance Inflation Factor) value. Suppose the tolerance value is greater than 0.1 (> 0.1) and the VIF value is smaller than 10 (<10). In

that case, there is no multicollinearity in the regression model. Therefore, based on the results obtained, it can be stated that there is no reason for concern the independent variables excessively influence each other, or it can be said that the regression model is free from multicollinearity.

The Error Term is Normally Distributed

The normality test uses to determine whether the regression residuals are normally distributed or not by using the P-P Plot (graphic) and Kolmogorov Smirnov test. Data is normally distributed when the data is spread around the diagonal line, and the significance value of the Kolmogorov Smirnov test is more significant than 0.05. The P-P Plot in Figure 2 shows the plots are following the diagonal line. The plot or the dots spread approximately around the diagonal line, which indicates the residual is usually distributed.

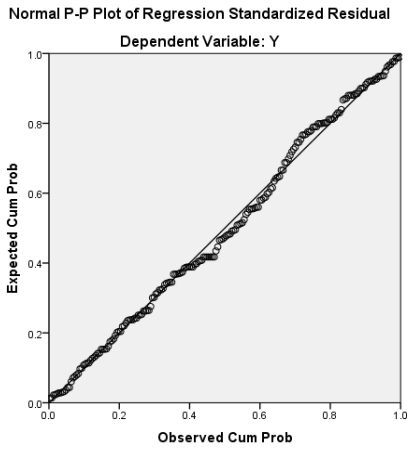

Figure 2. Normal P-P Plot of Normality Test

The result shows the Asymp. Sig values is greater than the significance value used (0.22 > 0.05). So, it can be concluded that the regression residual is normally distributed.

Multiple Linear Regression

Multiple linear regression aims to predict the state of the dependent variable when two or more independent variables are manipulated (Pawirosumarto2017). This research will find out the influence of website quality (X_1), product quality (X_2), product price (X_3), and safety shopping (X_4) on customer satisfaction (Y). This research using SPSS software version 24.0 to obtain the multiple linear regression equations. The result can be seen in Table 1.

Table 1. Multiple Linear Regression Result

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-.098	.278		-.352	.725
	X1	.177	.055	.168	3.192	.002
	X2	.397	.060	.387	6.598	.000
	X3	.198	.046	.215	4.278	.000
	X4	.259	.049	.262	5.350	.000

a. Dependent Variable: Y

Based on Table 1, the first column shows the constant value and the regression coefficient value of each variable. The constant value is -0.098 and the regression coefficient for variables X_1, X_2, X_3, and X_4 is 0.177, 0.397, 0.198, and 0.259 respectively. According to the result, the multiple linear regression equation is obtained as follow:

$$Y = -0.098 + 0.177X_1 + 0.397X_2 + 0.198X_3 + 0.259X_4$$

According to the multiple linear regression equation above, it is found that there is a positive relationship between the independent variable and dependent variable. A positive relationship is indicated by the positive regression coefficient value of each independent variable. So it is necessary to improve website quality, product quality, product price, and safety shopping to increase e-commerce customer satisfaction.

Determination Coefficient (R2) Test

The coefficient determinant can be seen in column adjusted R Square of output model summary from SPSS in Table 2.

Table 2. Determination Coefficient (R2) Test Result

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.840[a]	.706	.700	.41952

a. Predictors: (Constant), X4, X3, X1, X2

b. Dependent Variable: Y

The value of adjusted R Square in Table 2 is 0.700, this value is closer to one, so it can be said the independent variables have significant

capability in explaining the dependent variable. This 0.700 value means that 70% of customer satisfaction can be defined by website quality, product quality, price, and safe shopping. In comparison, the remaining 30% is influenced by the other factors outside the independent variables used in this research.

Hypothesis Test

The hypothesis test consists of a simultaneous test (F-test), which examines the simultaneous effect of independent variables on the dependent variable, and a partial test (t-test), which examines the effect of each independent variable in the dependent variable.

Simultaneous Test (F-test)

The F-test will be carried out using SPPS software version 24.0, and the result of the F-test can be seen in Table 3.

Table 3. Simultaneous Test (F-test) Result

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	81.948	4	20.487	116.405	.000[b]
	Residual	34.144	194	.176		
	Total	116.092	198			

a. Dependent Variable: Y

b. Predictors: (Constant), X4, X3, X1, X2

Based on the value obtained, there is sufficient evidence to reject H_0 with the conclusion there is simultaneously effect of website quality (X_1) variable, product quality (X_2) variable, product price (X_3) variable, and safety shopping (X_4) variable on customer satisfaction (Y).

Partial Test (t-test)

The t-test conducted using SPSS software version 24.0, and the t-test result can be seen in Table 4.

Table 4. Partial Test (t-test) Result

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-.098	.278		-.352	.725
	X1	.177	.055	.168	3.192	.002
	X2	.397	.060	.387	6.598	.000
	X3	.198	.046	.215	4.278	.000
	X4	.259	.049	.262	5.350	.000

a. Dependent Variable: Y

According to the t-test result in Table 4, it is known that website quality significantly affects e-commerce customer satisfaction until three stars because the significance value is 0.002. Then, the tcount is also significant than the t_{table} (3.192 > 1.972). So based on this value, there is sufficient evidence to reject H_0 and accept the H_1. Therefore, the conclusion obtained is website quality significantly affects the customer satisfaction of e-commerce. Product quality significantly affects e-commerce customer satisfaction until four stars because the significance value is 0.000. Then, the t_{count} is more significant than the t_{table} (6.598 > 1.972). So based on this value, there is sufficient evidence to reject H_0 and accept the H_2. Therefore, the conclusion obtained is product quality significantly affects the customer satisfaction of e-commerce. Product price significantly affects e-commerce customer satisfaction until four stars because the significance value is 0.000. Then, the tcount is more significant than the t_{table} (4.278 > 1.972). So based on this value, there is sufficient evidence to reject H_0 and accept the H_3. The conclusion obtained is product price significantly affects the customer satisfaction of e-commerce. Safety shopping has a significant effect on e-commerce customer satisfaction because the significance value is 0.000. Then, the tcount is more significant than the t_{table} (5.350 > 1.972). So based on this value, there is sufficient evidence to reject H_0 and accept the H_4. The conclusion obtained is safety shopping significantly affects the customer satisfaction of e-commerce.

Relative Contribution (SR) and Effective Contribution (SE)

Relative contribution uses to determine the contribution of each independent variable or predictor to the dependent variable as a whole without pay attention to other variables that are not examined in this research. At the same time, the effective contribution is used to determine each predictor's effective contribution or independent variable from the overall prediction.

The recapitulation of the relative and practical contribution values of each variable can be seen in Table 5. Based on the result obtained, it is known that the product quality variable (X_2)

provides the most significant contribution to customer satisfaction of e-commerce among the three other variables, as we can see from the relative contribution value of 38%. The following variable contributing to the customer satisfaction of e-commerce is shopping safety (X4) by 26% and product prices (X_3) by 19%. In contrast, the website quality (X_1) gives a minor contribution.

Table 5. Summary of Relative and Effective Contribution Value

Variable	Relative Contribution	Effective Contribution
Website Quality (X_1)	17%	12%
Product Quality (X_2)	38%	27%
Product Price (X_3)	19%	13%
Safety Shopping (X_4)	26%	18%

Nonparametric tests

Nonparametric tests have no distributional assumptions, particularly the usual assumption of normality. Nonparametric tests are ideal if a distributional model for a data set is unavailable (Couch et al., 2019). A nonparametric test is conducted to see differences in the factors studied: website quality, product quality, product price, and safety shopping, in each e-commerce. The nonparametric test performed is the Kruskal-Wallis test and the Mann-Whitney test. The null hypothesis in this test is there is no difference in product price between Shopee and Tokopedia. Based on the Mann-Whitney test result, the significance value obtained is 0.463. Because this significance value is greater than 0.05, there is insufficient evidence to reject the null hypothesis. So the conclusion is there are no differences in the product price in e-commerce Shopee and Tokopedia. The null hypothesis in this test is there is no difference in product price between Tokopedia and Bukalapak. Based on the Mann-Whitney test result, the significance value obtained is 0.055. Because this significance value is greater than 0.05, there is insufficient evidence to reject the null hypothesis. So the conclusion is there are no differences in the product price in e-commerce Shopee and Bukalapak.

According to the relative and effective contribution value in Table 5, the significant factor that influences e-commerce customer satisfaction is product quality because the relative contribution is 38%. This value indicates that among the four variables examined in this study, the contribution or influence of product quality on e-commerce customer satisfaction is 38%. Then, the effective contribution value is obtained by 27%. This value shows that from all the variables that affect customer satisfaction, whether in this study or not, the product quality variable influences customer satisfaction by 27%. Product quality has the most significant effect on customer satisfaction because customers are more focused on product quality. Customer satisfaction will be fulfilled when the product meets the customer's expectations.

The second significant influence or contribution on e-commerce satisfaction is safe shopping. It can be seen from the relative contribution value of 26%. This value indicates that safety shopping contributes to e-commerce customer satisfaction by 26% among the four variables in this study. Then from the calculation of the effective contribution, safety shopping affects 18% of e-commerce customer satisfaction among all the factors that affect customer satisfaction, whether in this study or not. Thus, safety shopping becomes the second significant influence on e-commerce customer satisfaction. There is an expectation from customers that the personal information gives to e-commerce will not be misused because there are so many incidents nowadays related to misused customer personal data. Then, when compared to product price, safety shopping contributes more to e-commerce customer satisfaction. Safety shopping is considered more important than product price because customers think the losses will be more significant if safety shopping is low. For example, when a customer has paid for a product and does not receive it, they will lose money and spend more money to repurchase if needed. So, no matter cheap the price of a product, if the safety shopping is low, the customer satisfaction level will be below. On the other hand, if the price is relatively high and the safety shopping is also high, the customer satisfaction level will be increased.

Furthermore, after the safe shopping, the third significant influence on e-commerce customer satisfaction is the product price. The relative contribution value of product price is 19%. It indicates that among the four variables examined in this study, the contribution or influence of product price on e-commerce customer satisfaction is only 19%. Then, the effective contribution can be seen to see how much the contribution of the product price variable is among all the variables that affect customer satisfaction. The effective contribution value is 13%. This value shows that from all the variables that affect customer satisfaction, whether in this study or not, the product price variable only affects customer satisfaction by 13%. The product price variable does not significantly contribute to customer satisfaction among the other three variables because the relative contribution value is only 19%. Product price contributes lower than product quality and shopping safety to customer satisfaction. It is because customers are more concerned about product quality and safety shopping. Suppose the product quality and the safety shopping meet customer's expectations, customer satisfaction will be fulfilled even though the price offered is relatively high.

The minor contribution to e-commerce customer satisfaction is website quality. It can be seen from the relative contribution value of 17%. This value indicates that website quality contributes or affects customer satisfaction by 17% among the four variables examined in this study. Then the effective contribution value is 12%. This value shows that among all variables that affect customer satisfaction, whether in this study or not, the website quality variable influences customer satisfaction by 12%. The important thing that concerns customers while transacting via e-commerce is the quality of products they will receive. Even though website quality still affects customer satisfaction, it will not be something that customers are concerned about. Because website quality is not directly related to the value of goods customers buy, website quality is only one of the supporting factors that help customers get the products they want. Suppose the website quality is not good, but the product quality is according to their expectations, so customer satisfaction will still be fulfilled. No matter how good the website quality of e-commerce, if the product quality does not meet customers' expectations, customer satisfaction will not be achieved because customer focuses on the value of the goods. It is the reason why website quality makes a minor contribution to customer satisfaction.

Therefore, according to the relative and effective contribution value obtained, the things that need to be considered by e-commerce to fulfill customer satisfaction: product quality, safety shopping, product price, and website quality.

IV. CONCLUSION

This research shows that website quality, product quality, product price, and safety shopping simultaneously influence customer satisfaction becausethe F_{count} is bigger than the F_{table} (116.405 > 2.42). Partially, the website quality, product quality, product price, and safety shopping influence the customer satisfaction, it proves by the significant value is less than the significant level (5%) and the t_{count} is greater than the t_{table}. The determinant coefficient (R^2) obtain is 0.70, it means 70% of customer satisfaction can be explained by the website quality, product quality, product price, and safety shopping. Furthermore, the most significant factors that influence customer satisfaction is product quality, this factor contributes as much as 38% among the other three independent variables in this research.

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